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GARDEN AND FOREST

A JOURNAL OF HORTICULTURE LANDSCAPE ART AND FORESTRY

DECEMBER 9 1891

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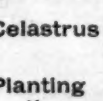

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Among the contents of next week's issue (No. 199) will be the following articles:

The Extension of Yellowstone Park.
EDITORIAL.

Celastrus paniculata. (With figure.)
By PROFESSOR SARGENT.

Planting About House-foundations. (Illustrated.)

The Colors of Leaves.
By E. WILLIAMS HERVEY.

The paper will contain an illustration of Helianthus orgyalis, near the wall of a house, and a figure of Celastrus paniculata, from a drawing by Mr. C. E. Faxon.

GARDEN AND FOREST.

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Mountain Forests and Mountain Streams.

HITHERTO the people of this country have suffered so little from mountain torrents that reports of their ravages in other lands too often sound like a tale of little meaning, and yet wherever there are high mountains with a sufficiently precipitous slope, and wherever streams flow through material which can be eroded, there is an absolute certainty that the short-sighted policy of clearing away the mountain forest will cause a repetition of the ruin which has been wrought in the French Alps and in many another place within the memory of living men. It is time, therefore, for intelligent Americans to inform themselves as to what an unchained torrent can accomplish, and we begin, therefore, in another column of this issue, the publication of an article which depicts the devastation caused by these furious freshets, which points out their causes and shows the only way in which they can be subdued. The article is not theoretical merely—that is, it does not state what might happen if certain laws are violated, but it records facts, and it has an especial value because it is prepared by the one man who is recognized the world over as master of the subject—a man who has not only observed and studied, but who has been the administrative head of the organized forces employed in the most extensive effort ever made to restrain the outbreaking violence of these mountain torrents, and even to subdue them to human use.

M. Demontzey, who read this paper before the Association for the Advancement of Science in Paris, has been in the French forest-service for forty years, and has risen from grade to grade until he is now at the head of one of the three bureaus into which the forest-administration in France is divided. Under his control come all the operations of reforesting, and in his field he is easily the first living authority. As early as 1853 he was engaged in the important work of reforesting a portion of Algeria, and ten years later he was placed in charge of the immense work which had been recently authorized by law of reforesting the mountains in southern France. The magnitude of these operations, and the success with which they have been carried on, give them high rank among the achievements of human science and skill. M. Demontzey has written a practical treatise on "Reforesting and Returfing Mountains," and his book is the authority on that subject. It has been translated into German, Italian, Spanish, and many extracts from it have been translated into English. The fame of his work has reached all countries, and wherever any laws are to be enacted or experiments made which look toward the protection of mountains from eroding streams, a commission is at once sent to France and to Demontzey for instruction. Italy and Austria, England, Prussia, Denmark and other countries have in this way received direct instruction and inspiration from his labors, and his influence will be felt for good in many lands and through many generations.

The testimony of such an authority ought to have convincing weight, and when he asserts that the clearing away of mountain forests renders the soil a prey to rushing waters, it becomes us to inquire how long we can keep on stripping the timber from our own highlands without disturbing that stable equilibrium which comes from the balance of opposing forces. It is a wearisome thing to repeat such warnings as this, but if Demontzey, after a lifetime spent in the work of reforesting the devastated mountains of France, finds that the story of it is still fresh enough to interest a body of men of science in the capital of France, we ought hardly to wonder that so little attention is paid to the subject in America. That forests preserve mountains has been demonstrated after fifty years of experiment in France, and that the forest is the only means of restoring a wasted mountain has also been amply proved. Fortunately, we stand as yet in no need of such restorative efforts, but it is well for us to know that if we bring this desolation by flood upon ourselves our only salvation will be found in replacing the woods which have been destroyed. Dams, retaining-walls and other works of engineering skill are helpful, but they are dead barriers only, and avail little against forces full of eager life. The aggressive violence of torrents can only be held in check by living agents, which are ever alert, and oppose themselves and their growth unceasingly to counteract and restrain the destructive work of flowing water. There is no safety for torrent-worn mountains until they are clothed again with living trees and vegetation.

It is more than the work of a day to reclothe a mountain with growing wood, but the law for reforesting the mountains has been long enough in force in France to demonstrate that some of the most violent torrents can be tamed. Agriculture has been renewed in places where cultivators had been driven from their farms. Mountains once a waste have been turned into homes for energetic workingmen. Desert slopes, which were not only useless but injurious to the valleys below, are now growing wood, which is not only a protective covering, but it is constantly increasing in value for human use. All this work, however, is accomplished at an enormous outlay. The labor and cost of the work, and the infinitely greater expense from previous loss, might all have been saved if the mountain forests had been administrated with ordinary prudence. The necessity for reforesting is the strongest argument for preserving the forests which already stand. The lesson we need to learn is not that it may be possible for us at untold expense to follow the experience of France and rescue our mountain-slopes and water-courses after the process of degradation and destruction are under full headway, but on the contrary, that we may escape all this loss by a timely effort to save the forest, which France is now taking such infinite pains to restore. We hardly need to be taught that the reforestation of a devastated mountain region is altogether too great an undertaking for private enterprise. But it has been also proved in France that forests are never safe without the protection of some power above that of individual owners. It is the state alone which can restore wasted forests or preserve those which already exist.

A Typical New England View.

TO any stranger desiring to see a typical New England coast landscape, the view from a house built a few years ago on the so-called "Beverly Commons," in the town of that name, might well be exhibited as combining many of the features which make our northern shore interesting and imposing.

The house itself is a rugged stone building, rising abruptly from a crag whose shelving surface slopes almost to the sills of the windows on the land side. The approach to it is through a wild and rocky dell, bordered with Pine-trees, some of which are of great size, with widely spreading branches. The rocks and trees are very striking in form and prepare the mind for what is to come. Little attempt at cultivating the grounds has been made, and the few exotic conifers that have been planted mar rather than improve the natural distinction of the surroundings. Their chief beauty consists in the masses of wild shrubs and herbage which come to the very edge of the irregular fragments of lawn that are here and there apparent near the dwelling, from the sea-front of which the view in all its majesty meets the eye.

In the foreground rises a great ledge of rock out of which spring great High-bush Blueberries of particularly graceful grouping. Beyond and around the ledge Golden-rod and Sumach follow the fine curves of the rocky surface, and then the eye is led gently into the middle distance where the soft outlines of Pines rise in gentle undulations, till suddenly a round, wooded hill forms a strange and striking curve in the sky-line, which is further diversified in the purple distance by bits of the shore, with a light-house on a point running out into the bay, and glimpses of the blue sea broken by the contours of distant islands. As far as the eye can reach the solitude is unbroken, nothing visible but the thin blue water-line with its rocky bluffs in soft haze of remoteness, and the great swell of the Pine-clad hill, of deepest softest green, rolling in noble curves to other masses of verdure that fill the hollows and rise again in echoing curves on either hand, with wide-spreading arms of Pine-trees, a single one outlined here and there against the sky. The middle-distance has somewhat the effect of a great rolling heath, which resolves itself near at hand into component parts of Blueberry-bushes, and Sumach, and other familiar herbage.

When I saw this view the Golden-rods were fading and the Sumachs just touched with autumn red, but when these last are one glowing flame, in startling contrast with the unchanging evergreens, the effect must be still more wonderful, as brilliant color would then combine with noble form to render the landscape extraordinarily beautiful.

A distant view of the Danvers Hills, rising along the western horizon, adds to the charm of this remarkable scene, and glimpses of other points and islands are caught between the swelling outlines of wooded hills, so that the outlook is perpetually varied, and as the mists veil and unveil its loveliness, must be full of mysterious suggestion to those who are privileged to contemplate it at all seasons and hours.

So strange and lonely is the spot, so rugged the house, and so wild the aspect of the ledges with their fringe of native shrubs, that the imagination takes wing, and weaves legends, and dreams of stories of uncanny deeds done in this desolate place, and peoples it with imaginary denizens, with histories and experiences to match the beautiful but savage landscape. The house when I visited it was uninhabited, which added still more mystery and charm to this lonely scene, leaving the fancy free to roam, and to evoke appropriate forms and events for this American Wuthering Heights, which on a windy winter day must be as eerie a dwelling as the one Emily Brontë pictured on her Yorkshire moor.

Unique as is the view, it is curiously characteristic, seeming to combine all the various elements that lend beauty to the majestic New England shore — rocks, hills, the sea, with glimpses of distant islands and elevations, and the simple but impressive forms of vegetation that can find sustenance in the decomposing surface of stones and arid downs.

The Pines are of exceptional loveliness; there is a furry softness about their great masses of foliage, full of lights and shadows, that seems to clothe the rugged surfaces with warmth and comfort. No tree seems so appropriate for a bleak and tempestuous region as this in which nature loves to enwrap her dreariest and most uncompromising wilds. Its aspect consoles, suggests shelter and protection; the roundness of its masses seems to soften the asperities of the hard surface from which it springs. Amid desolation it is the friend of man, affording him a roof by day, light and warmth by night — a pillow for his weary head, a carpet for his aching feet.

In this wide view the Pines appeal most strongly to the heart and give softness and beauty to a scene otherwise appalling in desolation. The fine sky-line without their feathery foliage would be harsh and unsympathetic, the intervening spaces barren and stern, the foreground unsheltered and drear. Thanks to their welcome presence, the eye rests gratefully upon as beautiful a prospect as can anywhere be viewed on the Massachusetts coast, the foreground being in perfect keeping with the distant views, and the whole making a delightful combination for a nobly representative type of New England scenery, in which woods and the ocean are happily combined, in the way that is best seen on that part of the coast north of Massachusetts Bay.

Hingham, Mass. *M. C. Robbins.*

The Colors of Flowers.—II.

Yellow.—Having proved the primary color of flowers to be white, the query naturally arises, Which is the second in the order of progression? Is it red, yellow or blue? Is there, indeed, any established sequence?

Following the method already pointed out we shall endeavor to answer these questions, first taking up yellow flowers. Of course, we must put aside all corollas wholly yellow, such as Buttercups, Potentillas, Caltha, Celandine, Œnothera, etc., and find some whose claw, throat or tube is other than yellow.

The tips of the yellow central florets of the Sunflower (*Helianthus annuus*), for instance, are chocolate-brown, but this cannot be the foundation color, for one should look for it at the base rather than tip; but we find the tubes of *Sonchus oleraceus*, Prenanthes, Hieracium, Lactuca, Leontodon, Taraxacum, the bases of Oxalis, yellow Pansies, the true yellow flower of *Polygala sanguinea*, garden Snapdragons, etc., all of them to be white, some more so than others, but never any other color except it be a special marking. In *Gnaphalium polycephalum* the long tube remains green, while the minute corolla quickly turns from white to yellow. Garden Nasturtiums, Tropæolum, are traced down from orange-red, or even a deeper shade, through every degree of yellow to the most delicate cream color, thereby establishing white as the foundation. Yellow in its lighter shades being nearest to white is more difficult to detect than any other color. Specimens of *Prenanthes alba* would probably be called white by some, yet when placed beside a pure white, as that of *Maruta Cotula*, they are seen to be "off color" and inclined to yellow, while *P. serpentaria* is clearly yellowish; quite likely, in course of time, their colors will become more pronounced.

Within half a mile of my summer residence are sixteen species of Golden-rod (Solidago), fifteen of which are bright yellow; but these are of no avail for our purpose. Nature, however, comes to our aid by leaving the sixteenth in its original white state. We examine it carefully, and find it even lighter than cream-color, substantially white. Yet its variety, *S. concolor*, is yellow. The pappus of the Golden-rods is pure white. Turk's Cap Lily exhibits a small area of white low down about the midrib before the yellow develops.

Mr. Grant Allen remarks in regard to the Daisy tribe as follows, p. 53: "Now, the earliest ray-florets would naturally be bright yellow, like the tubular blossoms of the central disk from which they sprung. And to this day the ray-florets of Sunflowers, etc., are like the central flowers. In the Camomile, however, the Ox-eye Daisy and the May-weed the rays have become white; and this, I think, fairly establishes the fact, that white is a higher development of color than yellow.'

Now, as to the ray-flowers of May-weed becoming white from yellow, we have already proved them (above, under white-flower section) to be derived from green, and therefore primary; as to the central florets, which are yellow and whole-colored, we have, of course, usually no direct proof, but simply because they occupy a central position is not sufficient evidence that yellow is their primary color. Among the Asters similarly with white rays, as in *A. dumosus*, *A. diffusus*, etc., indeed, in many others we find yellow central florets, also red-purple, and both on the same plant, and also mixed in the same head! In *A. diffusus* and several other species the colors change directly from yellow to purple. Here we have, according to that theory, the lowest color and "the latest fabrication" growing side by side under exactly the same conditions, and yet no white or intervening color between them!

But in regard to the central florets of *Maruta Cotula*, notwithstanding the very short tube and the usually well-covered corolla, it has been noticed that the yellow is much paler at the base, and, moreover, some specimens growing in the shade were found in which the tube showed no yellow. Then, too, *Aster diffusus* has central florets varying from deep yellow to nearly white. If specimens of this lightish variety growing in the shade, as, for instance, in a grove or open wood, are examined, flowers can easily be obtained without a trace of yellow in corolla or stamens, and of that apparently colorless but really faint white character noticed in *Spiranthes gracilis*. The tubes of several of the larger species, as *Aster Novæ Angliæ*, *A. Herveyi*, etc., and *Senecio vulgaris*, are at first white.

There is a greater natural tendency to yellow than to red or blue, as shown in the number of yellow-colored flowers, which exceed all others but white. The color, too, responds very quickly to the sunlight, and varies in the smaller Asters, according to the amount of light. Why this tendency exists is not known, but certainly yellow in its lightest shades is nearer to white than any other color—so near that the eye cannot detect its commencement, and on that account alone it would seem to be most natural to diverge in that direction.

A breeder of Cochin fowls of large experience, and himself an artist, and therefore well versed in color, informed the writer that to obtain a perfectly white color the fowls must be kept in the shade, and that if exposed to the sun the white became a straw-color! Another artist remarked: "Yellow color has a great deal of sunlight."

The foregoing examples are of themselves ample proof that yellow is derived from white; but if any one should prefer to see with his own eyes the actual development of a rich, pure yellow from a snow-white petal his wish can be gratified; let him observe *Lonicera Chinensis Halli*, now very common in our gardens. This flower opens a pure white corolla, with pure white stamens and pistil; almost immediately a change of color begins—the precise moment it would be difficult for human eyes to determine—and in a few hours both corolla and stamens become a beautiful yellow. The flower has not wilted nor faded in the least, but, while still fresh, the transformation from white to yellow has been accomplished. Both the pure white and the pure yellow blossoms, with intermediate shades, can always be seen at the same time upon the same vine, the yellow continuing fresh several days. Some flowers show color in the bud, others delay their permanent coloration, like the Fringed Gentian, which is green in the bud and only becomes blue as it unfolds its fringed lobes to the sunlight; others still, like *Cobea scandens*, do not change the green corolla for a day or two after full expansion.

With the example of *Lonicera Chinensis Halli*, before one, the evidence is complete. There appears to be a misapprehension regarding the prevalence of yellow-flowered species; they are not as supposed, at least in this region, in excess of white; the writer, in his "Flora of New Bedford and the Shores of Buzzard's Bay," estimated their number to be equal to the white; but in that estimate the main color only was counted, as, for instance, a flower with a white ground and purple dots or streaks was called purple; a Thistle, with a chalky white tube much longer than the colored part, was counted rose-purple, and disk tubular florets were not counted in; if, however, each species were credited with all its colors, it is plain from the preceding and following examples, which show white in nearly every instance, that that color greatly predominates, and, of course, it cannot be said that "nearly all stamens," if filaments are intended, "are yellow," when not more than one-third of the flowers are of that color. The proportion, however, in tropical or arctic regions may vary from this.

Greenish yellow in petals appears to result from imperfect elimination of chlorophyl from the thicker parts of the petals, such as the veins, etc. The effect is seen in white flowers, as Chelone and Parnassus, also in Fringed Gentian, where the green, frequently remaining on the outside of the lobes, gives them a dingy appearance, or it may result from the development of some blue in a yellow ground, as purples often follow yellow.

RED.—We now direct our attention to the reds, which are the easiest of all the colors to trace, for the reason that the change can always be seen in progress, and that whereas the inception of yellow in its lightest shades cannot be detected, any one can recognize a red on a white ground. It will require but a few illustrations to prove what is already so well known, that red is derived from white, namely:

Achillea Millefolium. Turns from white to rose; specimens occurring wholly rose-colored.

Rhododendron viscosum. White Swamp Honeysuckle is often tinged with pink, while *R. nudiflorum* is wholly pink.

Burdocks. Both white and red occur on the same plant.

White Clover becomes red.

White Pond Lily (*Nymphæa*) becomes pink in varieties.

Cornus florida has a pink variety.

Hydrangea paniculata grandiflora. Changes from white to red.

Daucus Carota is generally tinged with red on its outer circle of umblets as it opens, and in, perhaps the majority of cases, the central floret of the entire umbel, composed of 1,000 or more separate flowers, is usually of a reddish color.

Saponaria officinalis has a white base.

Pluchea camphorata. Base of perfect tubular flowers, colorless to white; the lobes only are reddish.

Many plants, commonly red, often revert to white, as, *Gerardia purpurea*, *Cnicus pumilus*, *Polygala sanguinea*, *Rosa Carolina*, *Spiræa tomentosa*, *Convolvulus sepium*, and others fade to nearly white; and it is a fact proved from observation, that yellow, red and blue colors all fade toward white.

BLUE.—All of the following blue or purple flowers have their tubes or the bases of the corollas of a white color:

Lobelia inflata. Base white; also the tube of garden Lobelia.

Trichostema dichotomum. Lower half lip and tube white.

Sisyrinchium. Occurs white.

Lathyrus maritimus. Keel white.

Liatris scariosa. Tube white.

Gentiana crinita. Base white.

Ilysanthes riparia. Tube white.

Chicory. Has a nearly white eye.

Mikania scandens. Varies from white to red-purple.

Cakile. Claw colorless to faint white; limb purple.

Brunella. Throat and tube white.

Aster patens. Shows white at base, forming a whitish eye.

Morning Glory (Ipomœa). Tube white.

Centaurea Cyanus (Batchelor's Button or Corn-flower). Base of central florets half pure white and half pure blue. This is a very interesting study; the white turns rose-color, the rose coalesces with the blue, and the whole becomes purple.

It is a common occurrence that when blue and red develop nearly simultaneously, or even in adjacent parts of the flower, that they soon blend into purple. A blue Morning Glory of a light color changes to a very light red-purple, and a dark blue one changes to a dark purple. Other instances are seen in *Symphytum officinale*, *Lathyrus maritimus* and in many of the Asters, etc. Colors are affected by the proximity of other colors; the reds in a Turk's-cap Lily, the "honey-guides" in Oxalis and the "eye" in Coreopsis, all having a yellow foundation, are not so vivid as the reds in white flowers. The honey guides in a white Snap Dragon of the gardens are light lemon-color, in *Gerardia tenuifolia* a darker yellow, in a light blue Lobelia a different tone of yellow, and in a dark blue Lobelia they are substantially green.

One exception only has been found in our wild flowers where the base apparently was not white, namely, *Myosotis palustris* (True Forget-me-not). Here the tube is clearly yellow, but the blue lobes are not attached in the usual manner, that is, on the end of the tube, making one continuous cylinder, but the tube extends above the lobes, forming a crown, while the lobes are attached a little below on the outside of the tube, giving them an exceptional character. This flower is also remarkable in color changes; the lobes of the corolla, at first white, become tinged with rose and then change to pure blue, while the tube remains yellow. Thus four colors appear in its development. It is no more difficult to believe that this yellow tube was originally white than that other whole-yellow flowers were derived from white. The blue, it will be noticed, was derived from white, and a small portion remains at the base of the lobes. In Centaurea it also should be noticed that blue appears much before red, as it does also in Ipomœa. There was discovered in an examina-

tion of *Monotropa uniflora*, in a single instance, on one of the petals, a spot of the purest cerulean blue; it was, of course, accidental and is only mentioned as showing that the color sprung from white.

Stamens.—There would seem to be no good reason why stamens should be yellow, while petals of the same flower are white, red or blue, and the general impression that they are so, as shown by the quotation near the commencement of this paper, is found to be erroneous. In an inspection of nearly all the late summer and fall flowers it was found that, with only half a dozen exceptions, the filaments corresponded in color with the petals, and that in many instances they copy the same special markings, as: St. John's-wort has a small black dot at the bottom of every serrature of the finely serrate corolla, and a similar dot on the anther of every stamen; *Gerardia tenuifolia* has its white stamens dotted with rose-colored spots similar to those of the tube; *Cassia Chamæcrista*, base of some of the stamens purple, like the base of the petals. In Buda and Cakile the stamens are merely in a less advanced state of coloration, being colorless to white, and the petals rose and purple, and in *Hibiscus Moscheutos* the stamens also are white, branching from a central column, and the corolla rose-colored; also in *Linaria vulgaris*, with corolla two shades of yellow, the stamens are white, but in Rosa and Nymphæa the stamens are found to be in an advanced state of color—that is, each has yellow stamens, while Nymphæa has white, and Rosa pink or rose petals. The writer can only suggest as an explanation of these abnormal conditions that the white of Nymphæa has been infused with the yellow color of its abundant pollen, and not changed by the usual chemical action, and that the flat position of the stamens of the Rose on a broad receptacle, allowing insects to directly alight and trample over them, may be the cause.

Pollen.—Pollen is not universally yellow: it is found of all colors from pure white, as in Polygonum Hydropiper, etc., through every shade of yellow, from cream to the reddish brown of *Lilium superbum* and the purple of Gladiolus and other plants. It is a fair inference that, next to green, the primary color, not only of petals, but of all parts of the flower, is white.

Conclusion.—1. The primary color of flowers, next to green, is white.

2. There is no regular order of progression in colors, as, for instance, that red follows yellow, or that blue follows red or was produced at a much later date, as it has been demonstrated that the principal colors, yellow, red and blue, are derived directly from white, and therefore are of equal rank, although some are more prevalent than others.

Insects probably have aided in "fixing" and determining color to some extent in certain families, but before they could be established they must have appeared; and if the quality of sunlight and the texture of the tissue of petals was the same in primitive times as now, and there is no reason to doubt it, then, in all probability, as soon as petals were formed, however remote that time may have been, all colors, including blue or purple, began to appear. Indeed, in the simplest and, presumably, the oldest types of flowers given in Gray's Manual of Botany as Clematis and Anemone, the prevailing colors are white and purple.

The rainbow and the prism reveal the many-colored rays of a beam of white light; the colorless tissue of the petal gathers up these scattered rays of the sun and forms them again, not into an intangible sunbeam, but into a material substance, shining with the original white, from which the sun calls them forth, re-habilitated in all their pristine splendor.

New Bedford, Mass. *E. Williams Hervey.*

Deciduous Shrubs with Late Persisting Leaves.

OUTSIDE of the coniferous class there are very few shrubs which are of a truly evergreen character, and, at the same time, which prove sufficiently hardy to withstand the rigor of our northern winters. It is true there are a few belonging to different genera which survive, and are always interesting, but most of them require some protection in winter, and even with protection their endurance is not to be depended upon.

In the absence of any number of thoroughly hardy evergreen species, it is of interest to note those deciduous kinds which maintain their leaves until quite late in the autumn, usually until mid-November or later. A careful review shows quite a number of these, and the foliage of several of them holds a good color through many hard frosts. With the possible exception of the Privets, no one group or genus can be called distinctly characteristic for this quality, the original home and environment of each species having influenced the period of defoliation, and the habit being perpetuated in cultivation. But abnormal garden forms often differ from the type in a very marked degree, and the foliage of young plants is often more persistent than on older ones.

A look over the shrub collection of the Arboretum on November 21st showed the following which were noticeable for still retaining many leaves after the severe frosts and high winds to which they had been subjected. The list is a comparatively short one:

The common Barberry still held a few leaves, and showed some variation among individual plants, some of the garden forms holding more than others, but none being particularly interesting. Japanese species, such as Thunberg's and Siebold's Barberries, had not retained a leaf.

Near by the little Yellow-root (*Zanthorhiza apiifolia*) of the Alleghany Mountains had hardly dropped any of its foliage, and it was still fresh and bright with its yellow and orange colors, once more enforcing the lesson that it is one of the very best of low shrubs for covering the ground.

Only one deciduous hardy Euonymus held its leaves. This is merely a monstrous form of the common European Spindle-tree, and is known in catalogues as *E. Europæus, erecta nana*. It has never been known to flower here, and as its foliage does not assume any of the bright autumn colors of its parent species it is hardly worth cultivating except as a curiosity. The leaves at this date were still a dull green color and all persisting.

Spiræa Thunbergii was still splendidly covered with its rich-colored feathery foliage, and it stood alone in all the genus, as no other species retained any quantity of leaves, and the few that remained were not conspicuous for coloring. Complaint will be made that the lower portions of the stems of *S. Thunbergii* become naked and unsightly with age, a fault common to many shrubs, but one which may be overcome by proper pruning.

Nearly all the forms of the common European Blackberry (*Rubus fruticosus*) hold their foliage in a remarkably fresh and clean condition, and with much richness of color, proving a good late covering for rough places. Our own *R. hispidus* holds its foliage even better than the European species, and, in fact, it lacks little of being an evergreen. It is a slender trailing plant, and is useful for forming a thick covering over rocks, stumps, etc. The Dewberry (*R. Canadensis*) also holds many of its leaves until quite late—later than our native Blackberry.

Of all the hardy wild Roses the little Scotch, or Burnet Rose (*Rosa spinosissima*), is by far the best when regarded from the standpoint of late foliage bearing. When all the other species are leafless, the neat compact bushes of the Scotch Rose still hold a quantity of fresh, rich-colored leaves. An exception should be made in the case of the new and rare *R. Wichuraiana*, which was figured and described in the last issue of Garden and Forest. The leaves of this plant are still all retained and are almost as bright and fresh as in midsummer, but, on account of its low trailing habit, it is not conspicuous. *Parottia Persica* holds many of its leaves, though they have lost much of their color and are becoming dry; but *Itea Virginica* is almost as fresh and brilliant as at any time during the autumn.

Several deciduous members of the Heath family are conspicuous, the best of them all being *Leucothæ racemosa*, with abundant foliage, purple and brown above, the under leaves being yellow. The Stagger-bush (*Andromeda Mariana*) still holds foliage on the ends of its branches, and *A. speciosa* has not lost any of its clear light green, yellowish, or sometimes brown and purplish leaves. The Leather-leaf (Cassandra) is fairly an evergreen here, and so does not come under the present list.

Our largest shrubby Composite (*Baccharis halimifolia*) holds enough of its fresh green leaves to effectively set off the bunches of conspicuous white pappus borne by the pistillate plant. The Indian Currant, or Coral-berry (*Symphoricarpos vulgaris*) retains all its leaves in a very fresh state, the branches being bent under the weight of the regularly abundant crop of deep red berries, and *Viburnum Lantana* retains more than any other of its genus, but it is dull and uninteresting.

The only Honeysuckles which here hold good foliage so late are *Lonicera Standishii* and *L. fragrantissima*. The first has lost fully half its foliage, which falls while yet fresh-looking; but the leaves of *L. fragrantissima* seem to retain their chlorophyll and vigor until much later. Indeed, the habit of this plant here shows that it is quite evergreen in climates a little less rigorous than this.

The rich green-clad climbing Japanese Honeysuckle (*L. Japonica*) and Hall's variety of it are certain to attract atten-

tion, but it comes under the head of evergreen rather than late deciduous shrubs.

Nearly all the Privets are admirable for the late persisting quality of their foliage, the only exceptions in the Arboretum collection being *Ligustrum Ibota*, which is leafless, and the closely related plant called *L. Amurense*, which only retains tufts of foliage on the ends of the more vigorous shoots.

The true *Forsythia Viridissima* is often conspicuous by holding its leaves late. *Elæagnus angustifolia* and *E. umbellata* and the Hippophaës retain a large quantity of fresh-looking leaves of no particular interest or ornamental value.

Finally, the fine leafy condition of *Smilax glauca* seems to show that it is at this season superior to the common Greenbrier (*S. rotundifolia*) and to *S. Pseudo-China*, which have very few leaves left among their tangle of prickly stems.

Arnold Arboretum. *J. G. Jack.*

Fig. 91.—Hypericum Buckleyi.

New or Little-known Plants.

Hypericum Buckleyi.

THIS pretty and delicate Hypericum, of which a figure appears on this page, is one of the rarest of the North American species, it being known only on a few of the higher mountains of the Carolinas and Georgia, where it was first noticed many years ago by the botanist whose name it bears. It is a wide-branched plant with slender stems from eight to twelve inches long and covered with loose reddish bark. The leaves are oblong-obovate, from a half to two and a half inches long, rounded at the apex, gradually narrowed at the base, bright green on the upper surface and pale on the lower. The flowers, which are solitary and terminal, are borne on long slender bracteate pedicels; they are an inch across, with obovate sepals, bright yellow striated strap-shaped petals more or less rounded or acuminate at the apex, united styles and three-celled ovaries.

Hypericum Buckleyi was sent to the Arnold Arboretum in November, 1889, by Mr. F. H. Boynton, of Highlands, North Carolina, and flowered profusely here this year in the open ground at the end of June. Nearly all the American Hypericums are desirable garden-plants; most of the species are very hardy, their habit is good, and they usually produce their showy flowers at midsummer. *Hypericum Buckleyi* promises to be a good addition to a not very long list of small, handsome-flowered, and easily grown hardy shrubs, suitable for small rockeries or the margins of small shrubberies.

Our illustration is taken from a drawing made by Mr. Faxon from a cultivated plant.

C. S. S.

Foreign Correspondence.

London Letter.

BORDEAUX MIXTURE FOR POTATOES.—A fortnight ago I sent you some particulars of a trial of this mixture as a preventive to disease in Potatoes by Messrs. Sutton & Sons, of Reading, the result of which was most unfavorable to the mixture. Dr. C. B. Plowright, the eminent fungologist, now reports a trial of Bordeaux mixture on Potatoes which shows an immense gain in the yield of the dressed Potatoes as compared with those which were not dressed. The experiment was made in Donaghmore, Tyrone, only Champion Potatoes being tried. They were grown upon two different farms, the treated and untreated plants grew side by side, and were identical as to seed, manure, cultivation, etc. The mixture used was 32 lbs. copper sulphate, 16 lbs. lime, and 160 galls. water. It was applied by an Eclair Knapsack pump, price thirty-five shillings; the cost, including labor, being about ten shillings per acre. The leaves of the untreated plots were destroyed by August 21st, but the foliage of the dressed plots was quite green for nearly a month longer. The total yield from the plots treated with the mixture was 78 tons 14 cwts., while from a similar number of plots which were not treated the yield was 66 tons 13 cwts. The difference per acre was between one and a half and two tons in favor of the treated plots. This experiment certainly proves that in this particular case the application of the fungicide to plots of Champion Potato made a considerable improvement in the yield. But there are good reasons for believing that, under other conditions of climate and soil, the same Potato would have behaved quite differently, and, possibly, would even have proved better without the mixture. Further experiment is necessary before any definite opinion as to the value of the mixture as a fungicide for Potatoes can be reached.

[Experiments carried on for some years in this country seem to show that spraying Potato-plants with the Bordeaux mixture hinders the spread of the rot by preventing the germination of spores which are carried by the wind from infected to healthy plants.—ED.]

CYPRIPEDIUM INSIGNE, VAR. SANDERÆ.—According to a paragraph in *The Times* a plant of this Cypripedium has lately been purchased by Messrs. F. Sander & Co. for £250. The history of this variety is as follows: It was introduced by the St. Albans nurserymen in 1888 among a batch of *C.*

insigne, only one plant of the variety being found. When it flowered it was named by Mr. Sander in compliment to his wife. It was afterward divided into two, one of which was disposed of by auction for £70, Baron Shroeder being the purchaser; the other was sold to Mr. R. H. Measures, whose collection of Cypripediums is famous for its richness and splendid condition. Mr. Measures divided his plant into four, one of which was sold to F. L. Ames, Esq., of New York, one to Mr. R. J. Measures, and the third is that for which Messrs. Sander & Co. have paid £250. At this rate the single plant introduced three years ago has now a value of £2,000; at any rate, one-eighth of it has been sold for an eighth of that sum. Of course, the plant has this value only to collectors of Cypripediums.

Dendrobium formosum giganteum.—This is a most attractive Orchid at this time of year. Several very large importations of it were made last year and the year before, consequently the plant is abundantly represented in collections here now. Plants one and a half feet high, with stout leafy pseudo-bulbs bearing terminal clusters of from three to five flowers, each fully four inches across and suggestive in form of a Cattleya. They are pure white, with a blotch of deep yellow on the curiously plated lip. They remain fresh on the plant about a month. This species is abundant in north-east India and Burma, and as it travels well it is always plentiful and cheap in England. Its one drawback is its failing in health after about two years' cultivation. Still it is by far the largest and most beautiful of all white-flowered Dendrobiums, and it never fails to flower freely the first year after importation.

New Roses of 1891.—A writer in the *Gardeners' Magazine* calls attention to the following new kinds of Roses as being the best this year:

Margaret Dickson (Hybrid Perpetual) was sent out by Messrs. A. Dickson & Sons, who last year obtained a gold medal for it. Messrs. Dickson describe it as follows: "White, with pale flesh centre, petals very large, shell-shape, and of immense substance, magnificent form, growth very vigorous and covered with stout spines, foliage very large and dark green in color. Unquestionably the greatest acquisition made to Roses during the past ten years." This is a little too much to say of a Rose which has had only a year's trial, although at the National Rose Society's Exhibition it was awarded first prize for a stand of twelve flowers of a new Rose, as well as first for a stand of twelve white Roses.

Salamander (Hybrid Perpetual). "Flowers bright scarlet-crimson; very vivid in summer and deep and glowing in autumn; large and full outer petals reflexed, centre erect; free-blooming, strong in growth, constitution good." This is another gold-medal variety raised by Messrs. W. Paul & Son, with whom it was in fine condition in August.

Marchioness of Dufferin (Hybrid Perpetual). The raisers, Messrs. A. Dickson & Sons, describe this as "a worthy partner of our Earl Dufferin, which has attained a world-wide celebrity as the best dark Rose introduced since 1869. The flowers are of enormous size, their color a beautiful rosy pink, suffused with yellow at the base of the petals, which are reflexed. The growth is vigorous." This Rose was highly commended at the National Rose Society's Exhibition, held in London, and afterward obtained the gold medal when exhibited before the same society in Hereford. It is distinct in color, being almost lilac, and it is excellent in form and size.

Crimson Queen (Hybrid Perpetual). This is a most beautiful Rose, which I saw among Messrs. W. Paul & Son's flowers at the Temple Show. It has velvety flowers, colored maroon, shaded with fiery red in the centre; very large, full; globular in form. The plant is said to be very vigorous and to produce abundant and large flowers equally well out-of-doors and under glass. It will probably prove a good early variety.

Waban (Tea). This is of American origin, and is a sport from Catherine Mermet. It is described as resembling its parent in foliage and growth. The flowers are carmine-pink, splashed with madder-red, the reflexed petals more delicate in color. Roughly it may be called a deep-colored Catherine Mermet. It is being distributed in England by Messrs. W. Paul & Son, who have a very high opinion of it as a Tea Rose.

Medea (Tea). Raised by Messrs. W. Paul & Son, who describe it as having "flowers lemon color, canary-yellow in the centre; clear and bright shades of color; large in size; very full; buds inclined to be high-centred, but expanded flowers more globular; growth vigorous; a grand tea-scented Rose."

Mrs. Paul, another of Messrs. W. Paul & Son's new varieties, a Bourbon, is also spoken of very highly.

Kew. *W. Watson.*

Cultural Department.

Apples in 1891.—II.

Winter Apples.—Belmont is one of the early winter fruits that ought to be more generally grown. It is most popular in Michigan, is of fine quality and a very handsome blush yellow. It is often called Waxen, from its oily skin. It grows rapidly and bears heavily. The wood of the tree is brittle. Baldwin is too well known to need any description. It varies immensely on stock and with soils, and is best when grown on old trees grafted high. Spitzenburg is really the best of apples for cooking. For a time it was argued that the Spitzenburg had run out, and could no longer be grown; but if the fruit is syringed against codlin moth and the bark washed with kerosene emulsion, it will thrive, but it needs rich soil or high feeding. Hubbardston is a superb apple in December. In January it begins to lose its spicy flavor. It is a beautiful apple and borne here in abundance. Young trees often overbear. The wood is rather brittle. This year a tree of this variety in fruit has presented an appearance truly splendid.

Grimes' Golden is a fairly good apple of medium size and bears well. It does not rank as high here as in the west, but for vigorous growth and health the tree is admirable, and every orchard should have a few. Jonathan is an apple of the very first quality. It is a seedling of Spitzenburg, deep red in color and strikingly handsome. It bears enormously. Northern Spy is a superb fruit, and is almost a universal favorite. Throughout the whole Apple-belt, from the Atlantic to the Pacific, it does well. To be at its best it should grow on very open trees and in strong soil. When ripened in the shade this apple is flavorless. It is now our most profitable apple for general culture; this year, however, for some reason, the fruit is not high-colored. Rhode Island Greening is a long name, but we must retain it, as there are several Greenings in our orchards. It is not easy to get the genuine Rhode Island Greening, which is yellow fleshed and very rich-flavored. Eatable in December, the Greening is in good condition and high quality until April. Roxbury Russet is among the ten best Apples here. It bears admirably, the trees are very enduring, and for baking no late winter apple surpasses it. The tree is inclined to bear early, and to grow low and spreading. It is a favorite of the codlin moth, and the fruit is specially relished by fowl and cattle. Princess Louise, a seedling of Fameuse, is a handsome, delicious fruit, with flesh white, and a flavor much like its parent. It is beyond price, and very hardy. The Newtown Pippin, Peck's Pleasant and Canada Red are local fruits, and so, practically, is the Tompkins County King. This last never gives full crops outside a few favored localities unless syringed, and even then the crop is too largely defective. Swaar is an old English sort of extraordinary quality, a large, handsome fruit; and the tree is hardy, but not a first-class grower. Westfield Seek-no-farther has done as well as ever, and always does well, giving large clean fruit, handsome and very excellent for table use. Yellow Bellflower has done but poorly in this section, and generally in the east, but in the west is a prime favorite. It is specially in need of syringing. The Kirkland, a seedling from the Bellflower, is a grand acquisition, for a very large, very showy and very late keeper. Wagner I do not place low in the list because of its inferior quality. It is one of our very best; and for table-use in late winter is invaluable. For my personal preference I place together Greening, Jonathan and Wagner for late winter. It is a northern Apple, and will probably fail in the south.

Sweet Apples.—For summer I have named the old Harvest Bough, or Sweet Bough. For early winter, the Pound Sweet, grown as it should be on open trees, is the best. It is growing in favor again, after being displaced in part by Tolman's. It

gives enormous crops of fine large fruit. Properly handled it keeps till April. The best late sweet that I have yet seen is the Belle Bonne, an old Connecticut fruit, that does well here, and almost everywhere. A fine tree, early to bear, and a grand cropper of clear golden apples, and a fruit of delicious quality for table or baking that keeps till May. I have found a seedling sweet which seems the handsomest and best of all, but the tree is a poor grower, and apparently diseased. I am trying kerosene emulsion with some advantage.

No well-instructed apple-grower will hereafter attempt to raise this fruit without spraying against the codlin moth. Unless we use the well-tested remedies against insects and fungi our orchards will be simply nuisances. We have also to comprehend that no fruit needs more care in handling, and no tree more good feeding and careful pruning. Apples can no longer be successfully grown without brains.

Clinton, N. Y. *E. P. Powell.*

A Few Good Flowering Plants.

HEDYCHIUM CORONARIUM.—This is an admirable plant for decorating conservatories, and when planted out in rich compost and well supplied with water is seldom out of bloom, the pure white flowers being produced in terminal spikes after the manner of the Cannas, but possessing the additional advantage of being very fragrant. Under favorable conditions the plant will attain a height of six to seven feet, and soon forms a large clump of growths. *H. Gardnerianum* is another handsome member of this family, of somewhat smaller growth than the preceding, and with light yellow flowers. This species is somewhat more hardy than *H. coronarium*, and may be used to advantage out-of-doors in the summer. It is propagated by division of the roots, which is most satisfactorily performed in the spring.

CESTRUMS.—These rather old-fashioned greenhouse shrubs are seldom seen now, though quite useful for cool-house decoration, and not to be despised as cut flowers. *C. elegans* is one of the best, and, in common with its fellows, has simple leaves of more or less lanceolate outline. Its growth is rapid, so that it needs to be pinched occasionally in order to make a shapely plant. The flowers of *C. elegans* are purplish red, and produced in small terminal clusters. *C. aurantiacum* is a good companion plant to the last, the flowers being tubular in form and bright yellow in color. The foliage is smoother than that of *C. elegans*. *C. fasciculatum* and *C. Newelli* are also worth cultivating, the first bearing some resemblance to *C. elegans*, while the latter produces larger flowers of bright crimson color. All the members of this genus are readily increased by cuttings from the young growth, but for conservatory decoration old plants that have been cut back are preferable, as they usually produce a better crop of flowers, although they require some stimulating with liquid manure to develop their best form.

BEGONIA INCARNATA.—This is a very useful species of this useful genus, and is specially adapted for pot-grown specimens for winter flowers. It is possibly better known as *B. insignis*, and bears a profusion of large light pink flowers during the whole winter. The color of this Begonia is a very pleasing one. A few plants of it dotted about a conservatory are extremely effective, and it is a beautiful plant for any indoor decoration. *B. Froebeli* is another remarkably handsome species, but is not quite so easy to manage as the preceding. It has large cordate light green leaves that are more or less covered with dark hairs, which are more noticeable on the young foliage. The flower-spikes are quite strong on well-grown plants, and bear a considerable number of large brilliant scarlet flowers. This Begonia prefers a light soil, well enriched with dry cow-manure, and in watering it is best to avoid wetting the foliage, as this species is rather impatient of moisture on the leaves.

Fig. 92.—The Körner Oak, near Carlsbad.—See page 586.

PRIMULAS.—The Chinese Primroses especially are among the most useful small-growing plants for winter-flowering either in the dwelling-house or in the conservatory, and a succession of young plants should be provided each season for such use. They should be coming into bloom about this time in order to be most valuable. *P. Japonica* is also a showy plant, though quite variable in color, and may be had in bloom during the winter and spring months with but little difficulty. The flowers are about one inch in diameter, produced in successive whorls on a stout spike, the prevailing colors being shades of crimson and red. *P. verticillata* is another very pretty species of this extensive genus, and does not seem to have become common, though in cultivation for

many years. It has long lanceolate leaves that are covered with a white powder, and the flowers are quite large, yellow, and produced in whorls on a scape. This species does not relish much water over its foliage, and its beauty fully repays for any care required in its cultivation.

Holmesburg, Pa. *W. H. Taplin.*

A November Garden.

IT ought to be possible to make our gardens more interesting in November. Of course, this is the time of Chrysanthemums, which are apt to overshadow other things. But, however much one may value their useful flowers, it is well to have a few quiet plants in the garden as a relief from their rather dazzling prominence. A well-filled garden should have something of interest at all seasons, if it serve no other purpose than to draw us more to the open air. Many of us have managed to stock our gardens with plants which respond to the first indication of warmth, but most of us have relied on the Chrysanthemums to give us our latest pleasures in the open.

My list of small plants has been lengthening, and they are gradually giving me suggestions which I hope to utilize in the future for providing quiet dainty bits in the border to be enjoyed till the final closing of the garden-year, usually about the first of December in this latitude. Of course, there are few flowers to be had out-of-doors in November. An occasional Primrose opens, *Bellis perennis* is not easily discouraged, the Globe-flower, *Trollius Europus*, gives a few blooms, and, showiest of all, the Marigolds, if in a warm corner, may be depended on for stray flowers.

The flowers in the November garden must, however, be had mostly from bulbs—the Crocus and Colchicum. The autumnal Crocuses pleased me so much this year that I have an idea of trying for a bright autumnal effect in a border planted also with spring-blooming bulbs. There is a long stretch of time after such a bed is cleared and planted when, to say the least, it is not attractive. It has occurred to me that if, with the spring-flowering bulbs, we planted an assortment of autumnal Colchicums and Crocus, the bed could be made to do double duty and be attractive quite through the month of November. It might be necessary to provide temporary shelter for occasional very hard weather, but these flowers will stand a fair amount of severity. The available varieties, both of autumnal Crocus and Colchicum, are numerous, and they vary considerably the time of blooming, so that it would not be specially difficult to arrange for such an effect.

But any one who is really fond of plants finds that flowers are only one of the elements of beauty; and at this season one finds dainty bits to enjoy among the small hardy plants which, in the presence of luxurious summer growth, are too frequently overlooked. There is a never-failing fascination in some of the little alpine plants. The encrusted Saxifrages are really jewels, with their attractive rosettes, and always enjoyable even when not in flower. The mossy Saxifrages, also, may be had in never-ending variety, and when established are mostly gems. The low-growing Sedums are another family among which may be found numerous attractive plants. Some of them take on wonderful tints of coloring at times. Mr. Whittall sent me some Cyclamens from Asia Minor, whose leaves are so beautifully marked, and which are so very hardy, that they are even yet attractive. This has induced me to plant other available kinds, of which I find there are about a dozen. In slightly shaded places and well-drained soil I shall probably find a fair number successful. The present plants are as attractive to me as my favorite greenhouse varieties.

There are, of course, numerous other small things—Androsaces, Drabas, Arabis, etc.—which will gladden the gardener when well established. Small things are these, and many of them require much skill and care. One who gardens for pleasure does not consider them troublesome, and they are never tiresome. Some plants are like a mathematical demonstration, they go on in orderly reliable sequence. There is pleasure in the demonstration, and pleasure, too, in such plants, but seldom so much as in those which require more attention. At this time will often be observed the first signs of the spring harvest—the Muscaris have their foliage developed; in few Narcissus the tips are just evident; the foliage of Spanish and a few other Irises is appearing; and many interesting things may be noted in the borders. I do not share the fear of some that early developed foliage will suffer by hard frosts and cover nothing except the Oncocyclus Irises. Such foliage is usually developed slowly under hard conditions and is not readily injured. A slight covering of leaves, such as nature and kind winds scatter over the beds, is not objectionable and serves a useful purpose in preventing sudden thaws; but in my case, like that of many others, the demon of tidiness and destruction in the way of the occasional helper, usually carefully removes such evidences of apparent unthrift before one thinks to give warning. The same sometimes useful person also enjoys raking out the crowns of one's favorite plants unless restrained by a strong hand, and I am afraid he is not the only one who thinks a bare patch of earth an ideal fall and winter garden.

Elizabeth, N. J. *J. N. Gerard.*

Bacterial Disease of Celery.—There is a bacterial disease of nearly everything, and Celery proves to be no exception to the rule. About a month ago, while in the Celery-fields, near Greenville and Bayonne, New Jersey, looking after troubles of a fungous nature among the truckers, attention was attracted to a peculiar blight of Celery, particularly the variety known as the Golden Plume. The affected leaves were badly blotched with brown, the diseased spots having a watery appearance that suggested the work of nematode worms as much as that of bacteria. A microscopic examination of the infested leaves showed that, while nematodes and all forms of filamentous fungi were absent, there was an abundance of bacteria uniformly in all the diseased patches. It was an easy matter to secure these germs free from all others and grow them for purposes of inoculation. Leaves of Celery from healthy plants were then treated to the pure germs, and at the end of three days the disease had spread throughout their whole extent. From these decayed specimens the bacteria were again transferred to the cores of plants, and from these tender centres the disease spread with still greater rapidity, and the whole plant became decayed and worthless.

In these experiments it was determined that the bacterial decay proceeds most rapidly when the part of the Celery is kept constantly moist, but not wet. Celery-stalks placed partly under water, to which bacteria had been added, decayed quickly near the water's surface, and the submerged portions were the last to spoil. The practical lesson from this, so far as our limited knowledge suggests any lesson, is: Keep the Celery dry and cool as possible.

Rutgers College. *Byron D. Halsted.*

Prolonging the Fruit Season.—A curious fact in Pear-culture, and indeed in fruit-culture generally, is, that if the bulk of the crop is picked when ripening, and a portion of it, say a fourth or less, is left on the tree, the latter will cease to ripen and will remain on the tree in good order for a month longer. I picked some fine solid Buffum pears that were left on the tree a full month later than the main crop, which was gathered September 20th. The most perishable Plums, such as Washington, will behave in the same way. Nature provides in some fruits for a long succession by loosening the ripe ones from the stem. This is peculiarly true of the Gravenstein and Summer Strawberry apples; but it is often worth our while to follow Nature, and secure a long season of some favorite fruit.

Morristown, N. J. *M.*

The Subjection of Torrents by Reforestation of Mountains.

IN March of this year, before a special session of the French Association for the Advancement of Science, there was presented a paper so suggestive in connection with efforts now being made to arrest needless forest-destruction in our country, that we reproduce the essential parts of it in translation, kindly furnished by Mr. H. B. Ayres. It was from no less an authority than M. P. Demontzey, Forest Administrator of France, to whose indefatigable work for the last twenty-five years or more is due the success in redeeming the devastated mountain regions of southern France.

The author's vivid descriptions of experiences in the mountains of France remind us of the damaging and dangerous floods and erosions not only in the scantily wooded regions of the west, but also in portions of the eastern states, especially in the sandy regions of the south.

It was in France that the reforestation of mountains was first made the object of legislation. A long time ago, numerous statesmen, economists, engineers and woodsmen, far-sighted and impartial observers, acquainted by long residence there with the mountainous regions of southern France, warned the state of disaster and ruin, and unanimously urged

the necessity of modifying a condition that formed a singular contrast with the prosperity of other regions and threatened to compromise them also.

The government was apathetic, and, heedless of danger, continued to ignore a matter which seemed to interest only some poor districts crying faintly in their distress. But, at length, the disastrous inundations of 1840 brought from the lower Alps another cry of alarm that suddenly aroused public opinion.

A young engineer, Surrell, originally from the most densely forested district of Lorraine, published, under the guidance of Dufaure, then Minister of Public Works, his "Etude sur les Torrents des Hautes-Alpes." This masterly work was characterized by the most thorough analysis, the clearest observations, the most definite conclusions and the most advanced ideas of economy. It was the grandest plea ever uttered in favor of mountain-forests, and was awarded a Montyon prize by the Institute in 1842.

From that time the reforestation of mountains has taken rank among matters of high public interest in France; the government brought this important question to the attention of the general councils of many interested Departments, and the Forest-administration, while preparing a code of law, began in 1846 a series of experiments in reforestation, the results of which have not ceased to be of value. Political events caused a long delay, and it was not until 1860 that a permit for experimentation was granted. This was the first law looking toward the reforestation of mountains, and it was the result of aroused public opinion after the inundations of 1856, the losses by which have been estimated at more than 250,000,000 francs. There were clamorous politicians who maintained that reforestation of mountains was a chimerical and impracticable enterprise, which would only lead to disappointment. But the government was gaining knowledge from the experiments, and by 1876 it was able to lay before Parliament a new plan, which, after many debates, resulted in the law of April, 1882, for the Restoration and Preservation of Mountain Lands, in full force to-day.

The provisions of this law are of two classes: (1) Measures of encouragement, which consist in the power given the government to incite, by means of bounties, landed proprietors, communities and private citizens to improve lands hitherto unproductive, desolate and liable to erosion. (2) Measures of coercion, which authorize the state to demand the declaration of the public need of works termed "obligatory" at all points where a careful investigation shows that their execution is demanded by deterioration of the soil and real dangers.

If we investigate the causes of deterioration we find that the great enemy, in fact the only one that we have to combat, is erosion, the power of which is determined by the inclination of the slopes, the volume of water that may flow in a given time, and the friability of the soil or of the underlying rock. The maximum effect is accomplished by a torrent—that is to say, a stream of water with very steep beds and sometimes intermittent—conditions which give the greatest power to erode and transport from the mountains the materials which the stream deposits in the valley. This notable characteristic of the torrent helps to make the floods in the plains still more resistless by the enormous mass of solid material, which, washed into the rivers, increases the volume of their flood and constantly elevates their bed.

The problem of restoring and preserving mountain-lands must necessarily be stated thus: On one hand to suppress in existing torrents the possibility of erosion, and the consequent transportation of material, and to diminish the volume and the suddenness of floods—that is to say, to transform the torrents into harmless and even beneficial streams; on the other hand, to anticipate or to prevent all erosion which may give rise to either the formation of new, or to the renewed activity of extinct torrents.

Such a delicate enterprise should, therefore, not be left to the discretion of the owners of the soil, but should be carried on by some agency of wider authority. Hence these obligatory reforestations prescribed by the law, which gives to the state, in case of the refusal, the negligence, or the inability of the private owner, the duty of preparing for the formidable struggle, which it alone will be able to carry on with success. Upon the state, therefore, devolves the restoration of torrent-worn mountains.

It was estimated in 1860 that the area of denuded mountains needing reforestation would reach 2,964,000 acres. After the extensive surveys from 1884 to 1886, covering 8,645,000 acres, the total area to be placed under management by the state was fixed at about 790,400 acres, or a fourth of the whole area to be reforested. The operations upon the lands most needing them, however, will cost more than the reforestation of the three other fourths, which are to remain in the hands of their present owners and be made valuable by means of the state bounties.

Before going too far, it may be well to define clearly certain terms of our special vocabulary:

We say of a torrent that it is "in activity" when it erodes near its sources, deposits material of all sorts in the valley, and spreads out over its deposits.

We call a torrent "extinct," which, after a period of activity (be it long or short), becomes, owing to special circumstances, no longer able to transport eroded material, but has longer periods of high water, rising less suddenly and in diminished volume, so that it passes into the condition of a brook.

By "correction of a torrent," we mean the construction of certain works which give stability to beds and banks in order to arrest or to diminish the transportation of materials and to reduce the rapidity of drainage.

Finally, we distinguish among "active" torrents two different modes of action, according to the nature of their floods. In case the volume of water is greater than the volume of the materials it carries, the latter stop one after the other, as their resistance exceeds the transporting power. The coarser are left first on steep slopes, then pebbles, gravels and sands, as the grades grow less and less, the change of grade being well shown by the upward concavity of the profile of their beds. On the other hand, in the case of violent and sudden torrents, from the rapid melting of snow, or a hail-storm, where the volume of materials is much in excess of the volume of water (perhaps double or triple), the current may be seen in the form of mud more or less thick, in which rocky materials of all dimensions nearly touch, and which on very steep slopes are borne onward en masse. When this current flows into the valley, no longer confined between high banks, and reaching more gentle slopes, it slackens. But the larger rocks, by virtue of their acquired velocity, are less inclined to stop, and the deposition of material is in this case in exactly the reverse order of that by selection in regular floods.

The very characteristic name of washes, or washouts, is given to these strange floods which sometimes cross the river to which the torrent is tributary, dam it for the moment and leave on the opposite bank great fragments of their advance-guard, which remain for years in testimony of the violence with which they have been swept along.

The field of action affected by the forester covers in great part three mountain systems in the south of France: The Alps, the Cévennes and the Pyrenees.

I.—THE FRENCH ALPS.

The group of the French Alps presents all possible forms of erosions, washings, land-slides and other devastations that the torrent is able to produce in the most diverse climates, and at various altitudes from the sea up to perpetual snow. This is the classic land of torrents, which there rule as terrible masters, to accomplish what Michelet strikingly called "la mort de la montagne."

In 1846 the illustrious economist, Blanqui, in a report to the Academy of Science, by which he had been charged with a special study of the situation in the French Alps, made a startling representation, from which I make some extracts.

"One who descends from Dauphiny toward Provence, along the summit of the Alps, is delayed at every step by the wild irregularities of the mountains. In nearly a hundred leagues he does not find a single navigable stream, not one of those great basins, like those of the Marne, the Saone, or the Yonne, which give life to whole provinces. The rivers of the Alps partake of the character of torrents, by reason of their rapid descent and their capricious course over a bed obstructed by rounded stones. Such are the Drac, the Romanche and the Durance, into which are discharged, through innumerable affluents, the melted snows from the perpetual glacial reservoirs, and the rains of all the upper region.

"The Rhone receives, in the lower part of its course, the astonishing product of these great floods which have acquired, in these later years, such alarming proportions.

"The bright clear skies of the Alps of Embrun, of Barcelonette, and of Digne remain, during entire months, free from the least cloud, and engender long droughts only broken by storms as violent as those of the tropics. The soil, deprived of herbs and trees by pasturing and by clearing, and dried by a burning heat, is washed quickly to the bottom of the valleys, sometimes in the form of lava—black, yellow, or reddish—followed by streams of pebbles and even by enormous rocks, which bound impetuously on with horrible crashing and destruction.

"From an elevated point the picture of this torrent-scoured country is that of desolation and of death. Immense beds of rounded pebbles, many yards deep, cover great areas, surrounding, and even covering to the top, the largest trees, and making a hopeless desolation of the farm land. There is nothing more depressing than the sight of these deep cuts, from which the mountains seem to have rushed out upon the plain to cover it over with rocks.

"The débris of these torrents can be seen a great way off, spread out at the mouth of the gorges, in the shape of a great fan, sometimes to the width of 3,000 yards, higher at the centre and inclined toward the edges like a mantle of rock over all the country. Such is their appearance when they are dry, but human language has no words to describe them at the moment of a sudden flood, when they break out with unrestrained violence which has no parallel in the ordinary behavior of river waters. Sometimes the unchained torrent strikes a river at right angles and forcibly rolls it back toward its source; elsewhere, two torrents, from opposite slopes, rush together in the middle of the river between them and assail each other with rock and gravel.

"The district is pastoral in the higher portions, and slightly cultivated in the valleys. Forests are rare, and, unfortunately, belong to the community. Their product is almost nothing. The expense of protection is beyond the local revenues, and the inhabitants vie with each other in destroying what is public property.

"The road system in the Alps is exposed not merely to the elements of destruction common to other parts of the country. The road engineers in the Alps are always ready for war; in winter, to open the road; in the spring, to repair it; in the summer, to guard against torrents. A warm wind, which suddenly melts the snows, a storm accompanied by pouring rains, a flock of goats or sheep which start a shower of stones, an avalanche which tumbles across the path, is sufficient to block all travel. The abrupt and often precipitous nature of the land leaves no escape from dangerous grades, and often compels the engineers to suspend the road over dizzy precipices. Works of engineering art are seen at every step, in the form of bridges, dams, embankments, or tunnels. Notwithstanding these constant efforts, travel is often arrested, and but few months pass without some tragic accident to spread alarm and terror among the hearts of the people."

Twenty years later, following the investigation of 1866, the Councillor of State, charged with the study of south-eastern France, in his report, prepared in 1868, described the Department of the Lower Alps as follows:

"What impresses one first in traversing the mountainous parts of the department of the Lower Alps is the imposing, but sad and desolate aspect which they present. Instead of the great forests or green pastures, which, according to local traditions, once covered them, they only show bald summits, arid slopes where a little brush still retains the scanty vegetable mold which the waters have not washed away, and deep ravines, where the torrents have rolled enormous avalanches of rocks and gravel. Here and there, as if lost in the devastation, upon heights or on slopes, apparently inaccessible, one sees a few poor dwellings; some abandoned, others, poverty-stricken relics of some industry which had managed to survive the land-slides brought on by ignorant clearing.

"At intervals, one comes upon villages surrounded by small estates that a rude population have laboriously created, and still more laboriously defended against the storms, torrents and avalanches which threaten our French Alps. Then, far apart, appear a few meadows, wooded hill-sides, or plateaus of good pasturage, whose slight inclination has saved them from the prevalent ruin. These are the oases of these immense wastes, and about them slowly, but incessantly, goes on the work of impoverishment which began more than a century ago.

"Every year the coat of vegetable mold, which has clothed the heights, is torn and diminished more and more. Every year the gravelly bed of the torrent is enlarged, and its débris encroaches upon the fertile plains of the river valleys. Every year some poor family sees its modest patrimony reduced, and it is small wonder if a population, with its means of subsistence ceaselessly threatened, becomes discouraged and emigrates to more hospitable regions. The ruinous condition of our frontier Alps produces the same painful impression upon all who see it. Every one is impressed with the necessity of making a vigorous struggle against these causes of impoverishment and depopulation."

Statistics furnish mournful information in this respect: In 1846 the population in the Department of the Lower Alps reached 156,675; in 1886 it was only 128,295. This shows a loss in forty years of 28,380 inhabitants, or eighteen out of every hundred. The population to-day is not more than 18.45 per square kilometer (247 acres), and there are districts like Barcelonette where it is reduced to 12.75 over an area of 1,716,800 acres. More than one-third of the land consists of abandoned fields and worn-out pastures.

Besides these districts, where formidable torrents develop into their highest activity, there are many other regions in which torrents of the first rank give place to myriads of smaller ones, which cover the hill-sides like a leprosy, and although their ravages appeal less strikingly to the imagination, they are quite as disastrous to the country.

The recent inundations, which caused in the lower valleys of Isère and of Durance a damage of thirty million francs, prove this only too well. Later rains only affected the lower part of the mountain-sides, and, fortunately, gave place to heavy snows in the higher part, but this only gives cause for apprehending a more sweeping destruction in the future. A rise of two or three degrees in the general temperature of the higher regions, a warm wind like the Foehn of Switzerland or the "Chinook" of North America, would melt the snow or change it to rain, and would more than triple the volume of water.

(To be continued.)

Correspondence.

The Körner Oak.

To the Editor of Garden and Forest:

Sir,—In my Garden and Forest of August 19th I read a brief notice of the great "Wurtemberg Linden." This notice had already attracted the attention of a gentleman now here, General W. J. Palmer, President of the Rio Grande Western Railroad, whose interest in the preservation of forests led to the recent withdrawal from sale and impending destruction of some 90,000 acres of woodland around the beautiful Rocky Mountain watering-place, Manitou. Our conversation about the Linden led to the discovery that one of Germany's celebrated trees, the Körner Oak, was but two miles from Carlsbad, and soon thereafter we visited it and made the enclosed measurements and photograph (see page 583).

The tree is 27 feet 10 inches in circumference six feet above the surface of the ground, 30 feet two feet above the surface, and by approximate triangulation is 75 feet high. One of the larger branches has recently fallen, and the giant evidently feels the weight of years. It is the largest of a group of primeval oaks that adorns the park of Herr Von Riegel, a gentleman connected by marriage with well-known New York families, and stands near his country-seat on the left bank of the Eiger.* It spreads its roots through the rich soil but a few hundred feet above the seams of brown coal, from which German students of fossil plants have drawn such an abundant harvest of specimens. From an inspection of the foliage I believe it to be *Q. pedunculata.*

It is widely, in Germany, known as the Körner Oak, and a tablet bearing the name of that "hero of the lyre and sword" is attached to its bole. The poet occasionally visited Carlsbad during his brief but remarkable career. He studied at the mining academy in Freiberg, and was familiar with the silver-bearing mountains that rise in rough serrations north of the Eiger on the Saxon horizon. His last visit to the neighborhood was in 1813, a few months before his tragic death. Beneath this Oak he is said to have composed his poem ending,

> Deutsches Volk du herrlichstes vor allen,
> Deine Eichen steh'n du bist gefallen!

In that admirable combination of scientific exactness and pleasing art, Henry Brooks' "Typical Elms and other Trees of Massachusetts" (which is praisefully introduced to its readers by the life-long lover of plants, Oliver Wendell Holmes), I find recorded the dimensions of some New England Oaks that will give the reader of these lines a basis for comparison.

The Eliot Oak, Dedham (*Q. alba*); girth, five feet above ground, 15 feet 11 inches; height, 80 feet. The Society Oak, Charlemont village (*Q. rubra*); girth, five feet above ground, 14 feet 6 inches; height, 58 feet. The Carter Oak, Lancaster (*Q. rubra*); girth, five feet above ground, 18 feet 5 inches. The Beaman Oak, Lancaster (*Q. rubra*); girth, five feet above ground, 17 feet 8 inches; height, 70 feet.

May I suggest to the amateur photographers in each of our four and forty states, six territories and the Federal District that they would earn the gratitude of a large and increasing circle of their most intelligent fellow-citizens if they would secure for publication and preservation the portraits and dimen-

* Cuttings from the Körner Oak are growing in the gardens of Oswald Ottendorfer, at 135th St., New York.—R. H. L.

sions of such remarkable trees as still remain to bear witness to pre-Columbian times—trees that, like their feral contemporaries, the Indian, the bison and the elk, are growing more interesting as they gradually disappear into the dim domain of history and legend?

Carlsbad, September 17, 1891. *Robert H. Lamborn.*

A Precocious Chrysanthemum.

To the Editor of GARDEN AND FOREST:

Sir,—A Chrysanthemum, bought in May from a city florist as "Mrs. Andrew Carnegie," began blossoming in the open ground about the middle of July, and continued to flower in a desultory way till October. The blooms were white, with a yellowish centre, not especially fine. What should have been done with this plant? Should it have been discarded as a passing freak, or taken in hand as having useful possibilities?

Whitewater, Wis. *A. S.*

[This Chrysanthemum might possibly have proved to be a precocious one. This is not at all probable, however. It is not unusual for these plants to bloom at any time, especially if they are checked and the wood is hardened up. It is very likely that the plant in question was from a stem-cutting, and, from the description, it may have been from the early Madame Desgranges. Any check which may have arrested the growth of wood would cause the early buds to develop. Ordinarily, when a plant is full of vegetative vigor the flower-buds are abortive, and it is usually only after the plant has practically finished its growth that perfect blooms are produced.—ED.]

The Nelumbo.

To the Editor of GARDEN AND FOREST:

Sir,—In your issue of November 25th, referring to the Nelumbo, you say "Perhaps some of the readers of GARDEN AND FOREST can tell us whether the Nelumbo is still found in Dr. Barton's station in the Delaware." I regret to say that the plant is probably not to be found there now. About four years ago, in company with Mr. William De Hart, who is familiar with the locality where the plant grew, I went to search for it, where, four or five years before, Mr. De Hart had seen the plant still growing. The place was not the river proper, but the large ditches, deep and wide, of which there are so many in "The Neck," as this part of Philadelphia is called. There was not a plant left of the many he had been accustomed to see. From a trucker who lived near by we learned that the roots had been carried away by gardeners to place in ponds at home, the last plants disappearing some two years before our visit.

Germantown, Pa. *Joseph Meehan.*

Recent Publications.

The Land of the Lingering Snow. Chronicles of a Stroller in New England from January to June. Frank Bolles. Houghton, Mifflin & Co., Boston and New York.

This little book is made up of chapters, some of which have been previously published, describing the rambles, in the neighborhood of Boston, of a man interested in all natural objects, but more especially in birds. The title of the book and the names of its chapters are particularly happy, and form a pleasing introduction to the experiences of the rambler, who goes forth to see reeds shaken by the wind, and other natural phenomena, within an easy journey of Old Cambridge, which appears to be his starting-point. He begins to wander in January, taking his latest trip the 29th of May; so that it is mostly with winter and spring landscape he has to deal, and he sets forth his experience in an agreeable way with many charming touches, but a certain monotony of tone, perhaps resulting from the fact that the book is not a connected whole but a series of separate sketches, more or less resembling each other in their general character.

The most vivid of them is the Equinoctial on the Ipswich Dunes, which is very breezy and spirited, and gives a clear impression of a wind-beaten shore and drifting sand, lashed by an angry sea, with accompaniment of whirling gulls and black ducks and some bright color in vegetation.

There is, in an account of a trip to the Waverly Oaks, the following suggestive though gloomy picture:

"At the sunset hour a strange glow permeated the mist, but it soon vanished. I left the hills and crossed the Belmont meadows. The twilight was weird. The mud of the Concord turnpike seemed unnaturally yellow; the pollard willows assumed horrid shapes; head-lights on distant engines made menacing gleams on the wet rails; the great excavations in clay beds, near the brickyards, were filled with black shadows from which rose vapors; brooks, once clear, now polluted by slaughter-houses, gave out foul clouds of mist, and, as electric lamps along the road suddenly grew into yellow balls in the fog, they showed, rising above them, crucifixes of this nineteenth century, on which are stretched the electric wires, whose messages of good or evil keep the nerves of society forever uneasy."

There are accounts of the sea in a snow-storm; of the Minute Man in a snow-drift; of views through winter sunshine that contain good and secure touches. Here is a bit of Concord, Massachusetts:

"About sunset, on Saturday, I was in a grove of venerable Red Cedars. The lower half of the trees was in shadow, the upper half in sunlight. Below, all seemed cold and dreary—the unbroken snow, the rough trunks of the trees, their sombre foliage. Above, all seemed warm and cheerful—the bright blue sky, the passing bits of white cloud, the upper branches of the Cedars glowing with golden olive-green. I sought an open ledge, where I could see from Blue Hill to Monadnock, and watched the sun sink into a bed of clouds. The after-effects of color were pronounced. Overhead, the sky was cobalt; low in the east it was pale Prussian blue; in the north it was deep orange, and in the west, silvery, with a few dark, ragged clouds shredded over it. After sunset, and just before darkness comes, colors, irrespective of the outlines of the objects to which they belong, stand out more forcibly than at any other time. This was noticeable Saturday evening. The red of a distant steeple was aggressive; so was the yellow of some tufts of dead grass, waving in the wind, and so was the russet of the dried leaves on a grove of Oaks or Beeches two miles distant. The sky at that hour was a matchless background for the copper-colored stems of the Willow-trees, the bewildering network of descending lines in an Elm's branches and twigs; and the distant rows of Maples, marching along an opposing hill-top, with the orange light of the northern sky burning through them."

An account of a night under a Pine-tree, with a great horned owl for a neighbor, is very entertaining, in the chapter called A Voyage to Heard's Island; and here, too, are some graceful descriptive passages, while throughout the book there are numerous pen-pictures that show a power of delicate and poetic observation.

There is a little too much cataloguing of birds, which appear in rather too exact numbers for artistic effect, though possibly not for the precision of the ornithologist, but in this our author is in touch with the modern microscopic idea, which will not permit a man to eat a piece of pie without telling the size and nature of it. The charm of mystical vagueness is not now a literary fashion; let us be thankful that Mr. Bolles is still permitted to employ his eye for the picturesque and his poetic feeling in such passages as the one about Chocorua "dimly present in the smoky heaven as conscience is present in the mind of man."

"The stars burned near it like altar candles. The smoke of fires rose round it like incense, the song of myriad frogs floated softly from the lakes below like the distant chanting of a choir, and the whispering of the wind in the Pines was like the moving of many lips in prayer."

There is a capital description of a swallow in the chapter called Chocorua, and much sympathy is shown everywhere for the feathered throng, with the names and habits of which Mr. Bolles is evidently familiar, so that their chirping seems everywhere audible in his landscapes, and their songs to form an orchestral accompaniment to his writing.

The country about Boston, even within a day's journey, seems to furnish much to interest this close observer, who keeps his eyes and ears open as he travels on foot or by train among the hills and marshes of his neighborhood. It is interesting to see how an enthusiasm for our immediate surroundings is developing in the youth of this observant age, and how they are learning to love their own dells and fens, and to honor them in song and story. Whatever opens the eye to the beauty about us is of value; whatever calls attention to the often unheeded charm of familiar surroundings is of distinct service, and this service Mr. Bolles has rendered in his carefully written pages. It is a book to be enjoyed as it was written, in detached chapters, when the full value of each passage can be felt as it deserves. Read continuously the work loses something of its charm, which arises from truth of detail, beauty of expression and a tender sympathy with all nature. For mountains, for the depths of the forest, for the raging sea, for the bittern in the

marsh, and the wren in the orchard, he has a genuine love, which finds expression in felicitous epithet and picturesque phrase, and in an inward correspondence of feeling which interprets as well as observes the objects which attract his eye.

The paragraphs that close The Bittern's Love Song and Warbler Sunday are evidences of the meaning which he finds in common sights, and prove him to be gifted with that poetic sense which gives a value to the simplest and homeliest objects.

Notes.

During the last five years the importation of oils into India has increased eighty-seven per cent., which means that mineral oil has almost altogether supplanted the vegetable illuminants of indigenous origin upon which for ages the population had relied.

Some years ago, when Hans Christian Anderson was visiting Tennyson, he said to the poet that Ivy seemed to be his favorite plant, to which Tennyson replied, "To tell the truth it is. Ivy needs no nursing; it knows neither cold nor heat; it is the plant of immortality."

Messrs. E. H. Krelage & Son, well-known horticulturists of Haarlem, in Holland, announce the introduction of a new strain of self-colored Tulips, which they declare to be of singular excellence and which they have named Charles Darwin. It is offered in many varieties. It would be interesting to know how nearly black is the variety which is not only blacker, they claim, than any Tulip previously produced, but presents "the most absolute black in the vegetable kingdom."

The *Gardeners' Chronicle* gives the picture of a new erect-flowering Verbena which has been introduced by some of the Erfurt seed-growers. This compact new type of Verbenas is said to have branches and spikes arranged about the principal stalk in a strictly upright position. There have been introduced before this year three colors of the type, which are all various shades of scarlet or lilac. The last one is said to have a velvet-like dark blood-red color, and so nearly constant that when grown from seed but few of the plants run back to scarlet.

A specimen of *Dichorisandra musaica* in the group of greenhouse-plants exhibited by Thomas Long, gardener to A. J. Drexel, at the recent exhibition of the Pennsylvania Horticultural Society, was an excellent example of good cultivation. The plant was grown in a ten-inch pot, and formed a perfect mass of shoots from twelve to eighteen inches in height. *Phrynium variegatum*, in the same collection, was also shown in admirable condition, the variegation being very clear and distinct, while the Golden Livistona, which occupied a prominent place at one end of the table, proved how effectively this plant may be used, especially when under artificial light.

In the current number of the *Gardeners' Magazine* the new *Lilium Henryi* is figured, and the figure shows how aptly the plant has been described as a yellow-flowered *L. speciosum*. It grows between three and four feet high, and the flowers have the same reflexing, lanceolate segments and the same raised excrescences on the surface. What distinguishes the plant is its color, which is a bright and decided yellow, relieved by the bold red-brown spots near the centre. As *L. speciosum* makes a good garden Lily in this country, it is not improbable that *L. Henryi* will do the same. It was found in 1888 on the slopes of precipices at an altitude of from one thousand to two thousand feet above the sea, near the town of Ichang, in the province of Hupeh, in China.

As an effort is now being made to set apart a forest-reservation about the wonderful and beautiful Crater Lake in Oregon, it is important to note how rapidly that region is being turned into a desolation. Mr. E. W. Hammond, who was there not long ago for the first time since 1875, reports that where a forest of Firs and Spruces stood sixteen years ago, with branches sweeping the abundant grass, which was knee-high everywhere, he found the ground as bare as a public road, the whole country having been pastured to death by cattle and sheep. Hundreds of blackened trunks of once beautiful Firs and Spruces now stand by the dried-up water-courses to mark the track of fire. In the midst of this desolation stands a great log corral, which was deserted because all herbaceous vegetation had been stamped out for miles around. Of course, it would be well if the entire region about the lake should be put under proper control, but the immediate approaches to it, at least, should be preserved from such vandalism.

Mr. John Thorpe, Chief of the Division of Floriculture in the Columbian Exposition, has been in this city on business connected with his work in Chicago. Mr. Thorpe speaks with enthusiasm of the possibilities which the great Exposition buildings and the broad grounds offer for a horticultural display which has never yet been equaled. He realizes, however, that time is crowding the work and that every moment will be needed to establish and develop the plants suitable for this colossal enterprise. It is to be hoped that the managers of the Exposition understand this point as thoroughly as Mr. Thorpe does, and that they will afford him every facility for hurrying forward the work in its earlier stages. It would be an incalculable misfortune if Mr. Thorpe were compelled to say at last: "What a magnificent exhibition I could have made if the proper support had only been given me at the proper time!" We ought to add that Mr. Thorpe himself has no fear that the enterprise will fail, in any particular, to justify the expectations of its most sanguine friends.

Mr. Edward Whittall, writing in *The Mayflower* of his recent discoveries in Asia Minor, says that a new Scilla was found on the western spurs of the Taurus in the same location where *Scilla bifolia Taurica* was said to have been discovered. This is the variety, no doubt, which has lately been named by Mr. Baker, of Kew, *S. bifolia Whittalli*. The Crocus family is largely represented in these regions, a beautiful variety strikingly like *C. Sieberi* being found on the Taurus, above the town of Adalia, the ancient Attalia. The Fritillarias have been found in great variety by Mr. Whittall. Previously he had found *F. Armena* (yellow and green), *F. aurea* and *F. acmopetalis*. This season's discovery is a Fritillary of checkered lilac and yellow, and somewhat smaller than *F. Meleagris*. It is peculiar in blooming in July, fully two months later than other sorts in these parts. The Snowdrop seems to be represented in Asia Minor only by *Galanthus Elwesi*, and this beautiful plant is found growing abundantly over all the region from the Straits of Mytelene to the heights over Samos. Mr. Whittall has heard of a yellowish variety, which, if description is true, will be welcomed by fanciers of the family.

In the private gardens of the palace at Osborne, on the Isle of Wight, where only, it is said, can Queen Victoria plant and cut and arrange as she pleases without consulting the officers of the Crown, she has a long array of memorial trees commemorating events which have occurred in her family circle. In one spot stands a row set out in February, 1862, when each member of the family dedicated a tree to the memory of Prince Albert, who had died during the preceding December, the one which the Queen herself planted being a Pine-tree. In another place is a group each of which records the marriage of one of her children, and it is under the shade of these, we are told, that Victoria prefers to have her afternoon tea-table set. Not far away is a large, luxuriant bush of Myrtle which has grown from a sprig which the Queen took from the bridal bouquet of her eldest daughter, the Empress Frederick. Myrtle is always used at bridal ceremonies in Germany as Orange-flowers are with us, and this bush now contributes to the adornment of all the brides among the Queen's descendants. Her grandchildren are now adding on various occasions to her collection of historical trees at Osborne.

In the last number of *Insect Life* we find a report of a new branch of entomological commerce which has just been started by a French firm—that is, the sale of culture tubes for the destruction of the white grub. The circular which the firm sends out explains that there has been discovered a specific vegetable parasite which destroys this grub. Following the methods of Pasteur, the firm have undertaken the artificial production of this parasite, and they offer to sell tubes containing the spores. They guarantee their cultures to be capable of communicating the disease to several hundred worms. The method of treatment advised is, to put about a hundred grubs in a vessel containing some moist sand. The contents of the tube are then sprinkled over the grubs, the vessel is covered, and at the end of six hours the grubs will have the disease. They are then taken out, one by one, and placed six or eight inches deep in the ground in different parts of the infested field and gently covered with earth. Of course, it would be prudent to place the diseased grubs in the portions of the field that are the most thoroughly infested. These grubs, inoculated with the disease, will communicate it to others, and if it spreads as rapidly and proves as deadly as the malady which has destroyed so many silk-worms, it may prove the most effective means of warfare against the white grub. But, after all, it seems at first like an unfair advantage to take of a worm.

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